PHOTO ESSAY

Incidental findings of multiple air emboli in the brain and orbit

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Abstract

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Bubbles of air are commonly introduced to the circulation in admitted patients. Various causes are related to hospital procedures, but intravenous injections are considered the most common etiology.¹ Usually, it is a clinically insignificant finding with no adverse effects. However, if a large amount of air is introduced, severe complications and even death may occur. Studies estimate that the injection of over 200–300 ml is hazardous and may lead to severe sequela.²

While circulating in the respiratory system, the air bubbles are usually absorbed and are asymptomatic. If the bubbles reach the cerebral circulation (through a patent foramen ovale, e.g.), it can cause a cardiorespiratory failure or stroke.³⁴ In these cases, patients may suffer from shortness of breath, confusion, headaches, and loss of consciousness.

Here, we present an incidental finding of air bubbles in a brain computed tomography (CT) scan. An 87-year-old female was admitted at postictal state, with fever and urosepsis. Medical history revealed a rapid cognitive decline and physical deterioration following a femur fracture 1 year before admission. She also developed atrial fibrillation and a new convulsive disorder. At admission, she had no shortness of breath, headaches, or visual disturbances. Aortic regurgitation without heart failure was documented. Radiological findings included multiple air bubbles at the right masticator space and two elongated bubbles in the superior ophthalmic vein of the right orbit [Figure 1a and b].

A similar case was previously reported following an intravenous injection in an 83-year-old female.⁵ Massive venous air bubbles are not common following intravenous injections, although small bubbles are frequently encountered. Additional etiologies include trauma or catheterization. Risk factors that may be contributed to air embolism, relevant to this case, are venous stasis in the atria due to atrial fibrillation. Breath holding required during injection of contrast agents at CT scans was also suggested to be a risk factor by increasing the intrathoracic pressure.⁶ Any patient with a peripheral intravenous catheter is considered at risk. Intensive catheterization and rapid infusion can increase this risk.⁷

Here, we describe massive air bubbles found incidentally on a CT scan. The patient did not show adverse sequela, and the air bubbles resolved spontaneously. Elderly patients, especially
debilitated and confused patients who need nursing care and assistance, should be followed carefully by an experienced team during intravenous fluid and medication administration. This routine procedure may result in lethal complications if not performed correctly and monitored according to the clinical guidelines.

**References**


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